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ABSTRACT

The cognitive clarity theory may be stated quite simply and briefly: (1) Learning to read involved applying general intellectual abilities to the task. (2) Reading is usually a silent activity, and there are very few outward signs of what the behavior involves. (3) Children do not know the basic concepts involved in thinking about the tasks of reading and writing. (4) Under reasonably good conditions the child works himself out of the initial state of cognitive confusion into increasing cognitive clarity about the purpose and nature of the skills of literacy. (5) Although the initial stage of literacy acquisition is the most vital one, cognitive clarity continues to develop throughout the later stages of education as new abstract concepts of language are added to the student's undertaking. In a model of the cognitive process of the literacy learner, the learner is assailed simultaneously by three voices: linguistic stimuli, the voice of the school culture, and extraneous stimuli. Applying this model to the data from the Comparative Reading Project, it becomes clear that there are many hazards in the child's linguistic and educational environments which may cumulatively cause the total level of cognitive confusion to become intolerable. (WR)

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THE COGNITIVE CLARITY THEORY OF LEARNING TO READ

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I. COGNITION VERSUS PERCEPTION

Elkonin (1972), the Russian authority on reading, wrote recently:

> ". . . the perception and discrimination of printed characters is only the external side of the process of reading, behind which lies hidden the more essential and basic behaviour, which the reader produces with the sounds of language. The speed of the movement of the eye does not define the speed of reading. Nor does the so-called 'span of apprehension' determine the speed of reading (i.e. the number of graphic symbols perceived simultaneously). Of considerably greater

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> importance than the speed of eye-movements and the span of apprehension is the speed of the underlying more central processes concerned with the behaviour of creating the sound form of the word and connected with it, its comprehension."

The theory to be presented in this paper is concerned with those "underlying more central processes" which Elkonin regards as the heart of the problem of learning to read. Reading research in the past has been overconcerned with the external aspects of reading--perception, eye-movements, visual discrimination, letter-name knowledge, etc.--at the cost of neglecting the conceptual and reasoning processes behind these surface features.

II THE COGNITIVE CLARITY THEORY

The theory may be stated formally but quite simply and briefly in five steps:

(A). Writing or printing is a highly abstract form of language which has been of universal concern for only about a century. Prior to that it was restricted to a tiny elite section of the population. Hence, any evolutionary development of a special area of the brain for the reading process, as some theorists of congenital dyslexia contend, is biologically impossible. Therefore, learning to read involves applying general intellectual abilities to the task.

(B). When people read, it is extraordinarily difficult to see what they are doing. It has taken great ingenuity and much expense for psychologists even to measure the movements of the eyes in reading. What chance has an ordinary child of 4 or 5 years of age to catch on to what the grown-ups are doing when they read? Reading is usually a silent activity, and there are very few outward signs of what the behaviour involves. No wonder that such young children find that "reading is a mysterious activity, to which they come with only the vaguest of expectancies," as reported in Reid's (1966) investigation of Scottish 5-year-old beginners.

(C). For these reasons, children enter the first stage of the learning-to-read process in a state of confusion about the purpose and nature of the task of acquiring literacy. They do not <u>know</u> or <u>understand</u> what is its purpose. They do not <u>know</u> or <u>understand</u> what kinds of activities they must learn. They do not <u>know</u> the basic concepts involved in thinking about the tasks of reading and writing. Hence this original condition is one of <u>cognitive</u> confusion.

(D). Under reasonably good conditions the child works himself out of the initial state of cognitive confusion into increasing cognitive clarity about the purpose and nature of the skills of literacy. This progressive development of cognitive clarity resembles the clearing of the fog of confusion which is the natural state of the beginner.

The child increases his cognitive clarity by solving the many problems with which he is bombarded on first being faced with the need to learn to read and write. The first and most important problem is "What is written language for? What can I use it for?" etc. Then there is a host of conceptual problems, e.g. "What is a 'word', a 'sound', a 'letter', a 'number', a 'line', a 'page', etc?"

(E). Although, the initial stage of literacy acquisition is the most vital one, according to this theory, cognitive clarity continues to develop throughout the later stages of education as new abstract concepts of language are added to the student's understanding.

A fair amount of evidence can be adduced for the cognitive clarity theory. The following researches all show the initial cognitive confusion of the beginner:

1. In Reid's (1966) Edinburgh study, mentioned above, intensive interviews with five-year-old beginners found that they showed a "general lack of any specific expectancies of what reading was going to be like, of what the activity consisted in, of the purpose and use of it."
2. Vygotsky's (1962) investigation into "the tremendous lag between the schoolchild's oral and written language" in Russia concluded that "it is the abstract quality of written language that is the main stumbling block," and the child "has little motivation to learn writing when we

begin to teach it. He feels no need for it and has only a vague idea of its usefulness."

3. The present author (Downing, 1970) replicated Reid's (1966) interview study, but with English children, with the following conclusions: "Young beginners have difficulty in understanding the purpose of written language." Also, "they have only a vague idea of how people read and they have a special difficulty in understanding abstract terms," (i.e. as are used in describing the parts of language, e.g. letter, word, etc.).
4. The Downing (1970) study also included experiments in which these 5-year-old children had to categorize auditory stimuli into certain linguistic units. Not one single child used the category "a word" or "a sound" according to the adult's concepts of these linguistic units.
5. Meltzer and Herse (1969) asked American first graders and kindergarten children to cut "a word" off a card which had a sentence printed on it. The results showed the same confusion over this concept.
6. Vernon (1957) reviewed all the evidence on reading disability and concluded: "Thus the fundamental and basic characteristic of reading disability appears to be cognitive confusion." Also, "this confusion resembles that of a young child who is just beginning to read." Thus the retarded reader is one who "remains in a state of confusion over the whole process."

Evidence for the gradual development of cognitive clarity in the normal child can be seen in Reid's (1966) original longitudinal study, but it is demonstrated rather more clearly in the present author's (Downing 1972a) follow-up of the five-year-old children in the interviews and experiments mentioned in paragraphs "3" and "4" above. The experiments on the children's categorizations of "word" and "sound" were conducted three times, 2, 6, and 9 months after first entering the Infants department. The data indicated that these children could be divided into three groups according to their rate of growth in understanding these two linguistic concepts. When the other data from the research were analyzed, it was found that these groups differed systematically in five aspects of the growth of cognitive clarity:

(a) Understanding the communication purpose of written language,

(b) Conceptualizing the symbolic function of writing,

(c) Understanding the concepts of decoding and encoding,

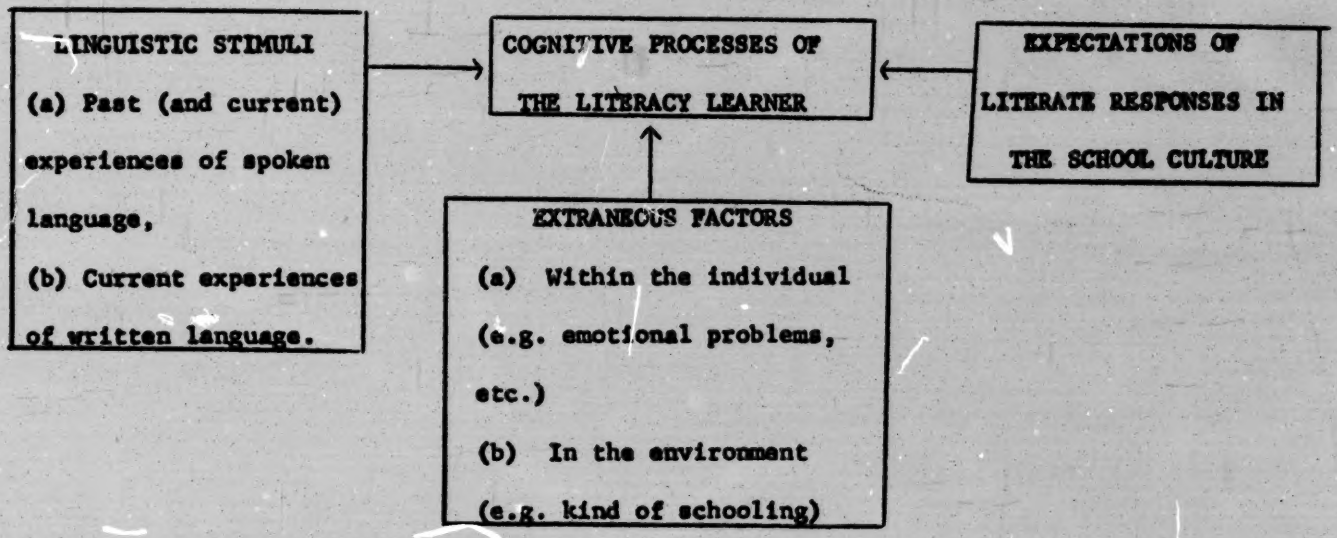
(d) Learning linguistic concepts,

(e) Developing the corresponding technical terminology for such abstract units of language.

In all of these respects, the behavior of the children in the three successive phases of this study clearly demonstrated how they were groping for solutions to the problems which faced them in trying to understand the purpose and nature of the tasks of literacy. As these problems were solved, one by one, so their confusion diminished and cognitive clarity grew.

II. A MODEL OF THE LITERACY ACQUISITION PROCESS

Further indirect evidence for this theory may be adduced from the cross-national study of reading completed recently by an international team of scholars in this field (Downing et al, 1972). In this "Comparative Reading" project, as it has been termed, the present author (Downing, 1972b) found that the analysis of the data from the 14 countries (Argentina, Denmark, Finland, France, Germany, Great Britain, Hong Kong, India, Israel, Japan, Norway, Sweden, U.S.A., U.S.S.R.) could be most readily understood in relation to the following model of the literacy acquisition process:


LINGUISTIC STIMULI
(a) Past (and current) experiences of spoken language,
(b) Current experiences of written language.
COGNITIVE PROCESSES OF THE LITERACY LEARNER
EXPECTATIONS OF LITERATE RESPONSES IN THE SCHOOL CULTURE
EXTRANEOUS FACTORS
(a) Within the individual (e.g. emotional problems, etc.)
(b) In the environment (e.g. kind of schooling)

In this model the cognitive processes of the literacy learner have their appropriate position of central importance. It is here that the child's struggle to move from cognitive confusion to cognitive clarity takes place. This struggle to solve the problems involved in understanding how to read is aided or hindered by forces from three directions. It is as if the cognitive processes of the literacy learner are assailed simultaneously by three "voices".

On the one hand the voice of linguistic stimuli speak to him in terms of his comparatively long past experience of his own spoken language and his new experiences of the written language which he is being required to learn. On the opposite side are the demands of the voice of the school culture laying down what kinds of literate responses are expected and acceptable. The third voice, though labelled "extraneous", is by no means unimportant. It is not one voice but many--a cacaphony of demands, both internal and environmental. Somehow or other the learner must work out his own cognitive solution to his problems in literacy acquisition--despite all this clamor.

Applying this model to the data from the 14 countries in the Comparative Reading project, it became clear that there are many hazards in the child's educational (Downing 1972c) and linguistic environments (Downing 1972d) which may cumulatively cause the total level of cognitive confusion to be raised above some individuals' threshold of tolerance. These then become the reading disability cases described by Vernon (1957) as <u>remaining</u> in a state of cognitive confusion.

The chief hazard is mismatch between the <u>linguistic stimuli</u> and <u>expectations of literate responses</u> parts of the model. Three kinds of mismatch were found to be of critical importance in increasing the level of cognitive confusion in the beginning reader:

1. Mismatch between the child's past and current experiences of <u>his own language</u> (L^1) and the teacher's expectations of literate responses <u>in her language</u> (L^2).

2. Mismatch between the child's perception of the written language and the language of the literate responses expected by the teacher (L^2).
3. Compound mismatches in which both the above occur, usually accompanied by the further mismatch between the child's own language (L^1) and the written language with which he is being presented.

Numerous studies indicate the confusion caused by mismatches of type 1. The most extreme form is where the child's language (L^1) is a foreign language in comparison with the language of literacy (L^2). Confusion mounts and many children become retarded or fail completely (cf. Macnamara, 1966; Modiano, 1968). A less obvious form of mismatch is the case where the child's <u>dialect</u> (L^1) differs from that of his teacher (L^2), but Österberg's (1961) experiments in Sweden prove conclusively that this too is an important cause of increased difficulty in literacy acquisition.

The serious difficulties caused by mismatches of type 2 are also well established by the evidence of scientific research. The present author's (Downing, 1967) experiments in contrasting learning to read in the traditional orthography (T.O.) of English with learning to read in the simplified or regularized system of i.t.a. (Initial Teaching Alphabet) provide the strongest evidence of the increased cognitive confusion caused by the perceived lack of fit between the T.O. writing system of English and the structure of that language in which the literate responses are to be made. But this type of mismatch has other more subtle forms. For instance,

as Reid (1971) has pointed out, the special styles of written language such as "said he", "this is a . . ." have no place in the beginning stages of literacy teaching because they are foreign to the style of even the everyday speech of acceptable speakers such as the teacher.

Clearly if both types of mismatch occur, probably involving the additional mismatch between the L^1 of the child and the L^2-based writing system he is supposed to acquire, there will be a case of cognitive "confusion worse confounded."

Several seemingly puzzling research results are explained by the cognitive clarity theory:

1. <u>How can beginning in one alphabet (i.t.a.) produce superior attainments later in another alphabet (T.O.)?</u>
   Initial cognitive confusion is reduced by the simpler code system of i.t.a. Once cognitive clarity is achieved it is general and can be transferred to other systems of writing such as T.O.
2. <u>How can learning to read in two languages be easier than learning to read in only one?</u>
   If the Mexican-American child speaks Spanish, for example, cognitive confusion is reduced by allowing him to develop initial literacy in Spanish. Thereafter, his cognitive clarity can be readily transferred to developing literacy in English.
3. <u>Why is it that many researches have found such a high correlation between early knowledge of the names of letters of the alphabet (e.g. Gavel, 1958, etc.), yet</u>

experimental teaching of letter-names (e.g. Ohnmacht, 1969; Johnson, 1970; Samuels, 1970) has no effect whatsoever on reading progress?

Knowledge of the letter-names is merely a symptom of cognitive clarity. Teaching children to mimic the symptoms obviously will not help their lack of the underlying cause, i.e. cognitive clarity.

4. Why is it that some reading disability cases are superior in visual discrimination to normal readers?

For example, Serafica and Sigel (1970) report that in their comparison of normal and disabled boy readers: "The boys with reading disability in this study do not seem lacking in an analytic ability. If the initial phase of learning to read requires differentiation of graphic symbols from one another, the non-readers were better equipped for that task than were the boys who showed no reading problems." This is one of several studies which reveal that visual discrimination is not a serious problem in learning to read. What is more important and what was probably lacking in these disabled readers, was the very opposite of discrimination, i.e. the ability to categorize written symbols in a logical relationship to the conceptual system they represent (i.e. an aspect of cognitive clarity).

Hopefully, these examples may show the potential explanatory value of this cognitive clarity theory of learning to read.

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